

# Inventory of Soil Resources of Sitamarhi District, Bihar using Remote Sensing & GIS Techniques

## Abstract

1. **Surveyed Area** : Sitamarhi district, Bihar
2. **Location** : Latitude 26° 15' 08'' to 26° 52' 18'' N  
Longitude 85° 14' 17'' to 85° 49' 42'' E
3. **Agroclimatic Region** : Middle Gangetic Plain  
(Zone – IV as per planning commission)
4. **Total Area of the District** : 219525 ha
5. **Kind of Survey** : Soil Resource Mapping using Remote Sensing and GIS Techniques
6. **Base Map** : IRS-ID Geocoded Satellite Imagery (1:50,000 scale)  
Survey of India Topographical maps on 1:50,000 scale
7. **Scale of Mapping** : 1:50,000
8. **Period of Survey** : January, 2015

### 9. Soil Series Association mapped and their respective area:

Sl. No.	Mapping Unit	Soil Series Association	Area(ha)	Area %
01	ALb1a1	Rasidpur, Muradpur	9300	4.24
02	ALb1a2	Rampattari, Baijnathpur	22903	10.43
03	ALb1a3	Mahmmoda, Kuwari, Madhubani	41181	18.76
04	ALb1a4	Madhubani-Rigo	39453	17.97
05	ALb2a1	Badhiyan, Bhagwanpur Bandh	11570	5.27
06	ALb2a2	Jabdi, Pakri	43856	19.98
07	ALb2a3	Pakri, Sursand	26128	11.90
08	ALb2b1	Sursand, Bhagwanpur Bandh, Dhankaul	991	0.45
09	ALe2a1	Marar, Kolsum, Dheng	4168	1.90
10	ALg2a1	Rampur Bandh, Majoura	3364	1.53
11	ALn1a1	Dheng, Dhankaul Bandh	8211	3.74
	Habitation		4560	2.08
	River		1668	0.76
	Waterbody		2172	0.99
		<b>Grand Total</b>	219525	100.00

## 10. District area under different following classes:

(i) Physiographic division of the soils of the Sitamrhi district of Bihar:

Physiography	Area (ha)	Area (%)
Alluvial Plain	195382	89.00
Flood Plain	8211	3.74
Levee	4168	1.90
Stream Banks	3364	1.53
Habitation	4560	2.08
River	1668	0.76
Waterbody	2172	0.99
<b>Total</b>	<b>219525</b>	<b>100.00</b>

(ii) Slope classes falling in the Sitamarhi:

Slope Classes	Area (ha)	Area (%)
Nearly level	202602	92.29
Nearly level to very gently sloping	8523	3.88
Habitation	4560	2.08
River	1668	0.76
Waterbody	2172	0.99
<b>Total</b>	<b>219525</b>	<b>100.00</b>

(iii) Various land use / land cover classes of the district are as under

Land Use Classes	Area (ha)	Area (%)
Agriculture	210134	95.72
Plantation	991	0.45
Habitation	4560	2.08
River	1668	0.76
Waterbody	2172	0.99
<b>Total</b>	<b>219525</b>	<b>100.00</b>

(iv) Erosion classes of the soils of the district are as under

Erosion Classes	Area (ha)	Area (%)
None to slight erosion	194391	88.55
Slight to moderate erosion	16734	7.62
Habitation	4560	2.08
River	1668	0.76
Waterbody	2172	0.99
<b>Total</b>	<b>219525</b>	<b>100.00</b>

## **11. Salient features of the district.**

- Total area of the district is under alluvium landscape and it is divided into four physiographic units i.e. alluvial plain, flood plain, levees and stream/river bank.
- Total 20 nos. of soil series have been identified and mapped.
- In the district 210134 ha (95.72%) area is under agriculture followed by plantation 991 ha (0.45%) and miscellaneous land i.e. habitation 4560 ha (2.08), River 1668 ha (0.76) and waterbody 2172 ha (0.99).
- About 202602 ha (92.29%) and 8523 ha (3.88%) of survey area having slope range 0-1% and 1-3% respectively
- About 194391 ha (88.55%) area having none to slight erosion hazard and only 16734 ha (7.62%) suffer from slight to moderate erosion needs attention for soil conservation measures.
- Soils of the area are taxonomically classified into three orders i.e Alfisols, Inceptisols. and Entisols. All the 20 soils series identified in the area are further classified into 5 sub order, 5 great group, 8 sub group and 14 families.

## How to Use Soil Resource Mapping Report

This report embodied the results of the Soil Resource Mapping of Sitamarhi district, Bihar providing information on the geographical setting of the district such as location, extent, physiography, relief, drainage, climate, geology, natural vegetation, agriculture, land use and soils.

The report contains other information on interpretative grouping of soils (**Chapter 8**) such as land capability classes, land irrigability classes, soil suitability grouping and hydrological grouping and also recommendation for crops; horticulture development, forest, forage and grassland development; water harvesting, water storage and water management that are essential for soil and land resource management. The genesis and classification of the soils are also discussed in **Chapter 5**

Sitamarhi district of Bihar is spread over an area of 219525 ha. The district is covered by 9 SOI topographical sheets on the scale of 1:50,000 which are used as base material along with satellite imageries.

Each soil mapping units is marked by mapping unit i.e ALb2a1 (Alluvium; alluvial plain; 0-3% slope; agriculture land use; soil series association describing Rasidpur as dominant series in association with Muradpur series). Each soil association is restricted to a maximum of three soil series.

For the use of the soil resource report, first locate the area of interest on the map and note down the soil mapping units. Permanent features such as road, stream, lakes and village habitation etc. shown on the map, help to locate the area of interest on the map. For the detailed information on soil mapping unit in respect of soil series of the area of interest, its extent, present and proposed land uses and reference may be made to **Chapter 4, Appendix I and II.**

The mapping unit used in soil mapping represents the five levels of mapping i.e ALb2a1 may be referred as follows:

AL	-	Alluvium	-	Landscape
b	-	Alluvial plain	-	Physiography
2	-	0-3% slope	-	Slope Class
a	-	Agriculture land	-	Land Use
1	-	Association of soil series with erosion and management soil unit.		

Any comment and suggestion on the report would be welcome. For further enquiry or clarification, correspondence or personal contact may be established with either of the following address

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